

# Clinical Description, Prevention, and Treatment of Pandemic Influenza

Thomas Chester, MD  
Centers for Disease Control and Prevention

The term “flu” is much used and abused. Some people use the term “stomach flu” as an informal way of saying “gastroenteritis of unknown etiology.” Others think that “flu” is any kind of illness with aches and fever with or without respiratory symptoms. **In reality, influenza is none of these things.** Influenza is a specific, often severe, respiratory viral infection caused by *influenza viruses*. The disease is characterized by abrupt onset of constitutional and respiratory symptoms, including fever, chills, muscle aches, headache, malaise, nonproductive cough, sore throat, and runny nose. Upper respiratory and constitutional symptoms tend to predominate in the first several days of illness, but lower respiratory symptoms, particularly cough, are common after the first week. In children, nausea and vomiting and, occasionally, ear infection are also symptoms. Complications of influenza can include pneumonia caused by the influenza virus itself and secondary bacterial pneumonia. Rarely, complications including encephalitis, Reye’s syndrome, and heart infections may also occur.

Since several other respiratory pathogens (including adenovirus, respiratory syncytial virus, parainfluenza virus, rhinovirus, coronavirus, human metapneumovirus, *Mycoplasma pneumoniae* and *Legionella*) can also cause a similar clinical picture, definitive diagnosis of influenza requires laboratory confirmation. However, laboratory testing is not necessary for all patients. In the presence of a community outbreak of respiratory illness, a presumptive diagnosis can be made based on knowledge of the predominant agent causing the outbreak. It is still necessary, however, to test enough patients to characterize the outbreak and to find out if a second agent is also in wide circulation. Laboratory confirmation is most useful when this knowledge will be used to guide treatment decisions, such as prescribing antiviral therapy for influenza (see below) or antibiotics for *Legionella* or *Mycoplasma*.

## Prevention

The primary method of prevention of influenza is immunization. Because influenza A viruses frequently change, a new influenza vaccine is needed each year. Because adequate production of influenza vaccine takes six months or longer, every spring, a panel of experts meets to decide which influenza strains will be included in the vaccine for the following season based on knowledge of currently circulating strains. In most years, this results in a good match between the vaccine strains and the influenza strains actually in circulation the following season. However, there have been years in which the circulating strain and the vaccine strains were a poor match, rendering the vaccine only partially effective. Because of the six-month lag time to produce vaccine once a strain is identified, it is unlikely that any substantial amount of vaccine would be available during the first wave of an influenza pandemic.

Antiviral chemoprophylaxis is also effective in preventing influenza or reducing the severity of illness. There are two classes of antiviral agents: the M2 inhibitors, amantadine (Symmetrel®) and rimantadine (Flumadine®); and the neuraminidase inhibitors, oseltamivir (Tamiflu®) and zanamivir (Relenza®). The M2 inhibitors are effective against most strains of influenza A but

are not effective against influenza B. In addition, some strains of influenza A, including the current H5N1 strain posing a potential pandemic risk, are resistant to the M2 inhibitors. The neuraminidase inhibitors are effective against both influenza A and influenza B. Resistance to the neuraminidase inhibitors has been rare, but recent reports from Asia indicate that some strains of H5N1 may be partially resistant to these agents as well.

Other preventive measures include covering your mouth when coughing or sneezing, frequent hand washing (influenza virus can be transmitted on hands and inanimate objects), discarding used tissues, and avoiding crowds and mass gatherings. Those with symptoms of influenza should avoid exposing others and should stay home rather than risk exposing others at work or school. In the event of an influenza pandemic, public health measures could include closing of schools and suspension of mass gatherings such as sporting events. Early in the pandemic, consideration might be given to quarantining contacts of the initial cases. These measures would be undertaken with the hope that the pandemic spread could be slowed long enough for vaccine to become available.

## **Treatment**

The same antiviral medications that are used for chemoprophylaxis are also available for treatment of influenza infection. Treatment, which must begin within 24 to 48 hours of onset, reduces the severity and duration of symptoms for most patients. Although antibiotics are not effective for treatment of influenza, secondary bacterial pneumonia should be treated with an appropriate antibiotic. Otherwise, treatment of influenza is largely supportive care, with assisted ventilation techniques required for severe cases of viral pneumonia.

Institutionalized patients should be placed in appropriate isolation with droplet precautions. Staff members caring for these patients should pay particular attention to masks and to hand washing. Staff members with symptoms compatible with influenza should not have contact with patients and should recuperate at home.